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10/631,858	08/01/2003	Kazunari Honma	024808-00014	9152

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EXAMINER

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/631,858
Filing Date: August 01, 2003
Appellant(s): HONMA ET AL.

Murat Ozgu
Reg. No. 44,275
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/8/2006 appealing from the Office action mailed 6/13/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,783,998	Nakamura	8-2004
4,581,099	Fukaya et al.	4-1986

Art Unit: 2814

*JP 11-068057	Furukawa	3-1999
6,046,469	Yamazaki et al.	4-2000
6,323,132	Hwang et al.	11-2001
6,320,213	Kerlin et al.	11-2000

*Translation provided

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1 to 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (U.S. Patent No. 6,783,998) and Fukaya et al. (U.S. Patent No. 4,581,099).

Art Unit: 2814

Nakamura shows most aspects of the instant invention (e.g. Figure 1(a) and Column 4 Lines 36 to 67) including:

- a first electrode **1** containing PT and formed by etching using fluoride gas which forms a platinum fluoride on its surface (Column 7 Line 58 to Column 8 Line 35)
- a ferroelectric film **2** of $\text{SRBi}_2\text{Ta}_2\text{O}_9$
- a second electrode **3**

Nakamura does not explicitly show the first electrode surface terminated by the fluorine atoms. Fukaya et al. teach (Column 4 Line 64 to Column 5 Line 2) that etching with halogen atoms, such as fluorine, terminates the material being etched. It would have been obvious to a person of ordinary skill in the art at the time of invention to terminate the surface of the first electrode of Nakamura since Fukaya et al. teach that etching with halogen atoms, such as fluorine, terminates the material being etched.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura and Fukaya et al., as applied to Claim 1 above, and further in view of Furukawa (JP 11-068057).

Nakamura and Fukaya et al. show most aspects of the instant invention (Paragraph 2) except for the bismuth layer being substantially perpendicular to said first electrode layer. Furukawa teaches (e.g. Figures 2 and 3) to have the bismuth layer being substantially perpendicular to said first electrode layer to provide a dielectric device with superior polarization characteristic (see PROBLEM TO BE SOLVED). It would have been obvious to a person of ordinary skill in the art at the time of invention to have the bismuth layer being substantially perpendicular to said first electrode layer as taught by Furukawa in the device of Nakamura and Fukaya et al. to provide a dielectric device with superior polarization characteristic.

Art Unit: 2814

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura and Fukaya et al., as applied to Claim 1 above, and further in view of Yamazaki et al. (U.S. Patent No. 6,046,469).

Nakamura and Fukaya et al. show most aspects of the instant invention (Paragraph 2) except for the adherent layer formed under the first electrode layer. Yamazaki et al. teach (e.g. Figure 1) to form an adherent layer **12,13** under a first electrode **14** to provide a semiconductor device with good ohmic characteristic (Column 2 Lines 40 to 44). It would have been obvious to a person of ordinary skill in the art at the time of invention to form an adherent layer under a first electrode as taught by Yamazaki et al. in the device of Nakamura and Fukaya et al. a semiconductor device with good ohmic characteristic.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura, Fukaya et al. and Yamazaki et al., as applied to Claim 1 above, and further in view of Kerlin et al. (U.S. Patent No. 6,320,213).

Nakamura and Fukaya et al. show most aspects of the instant invention (Paragraph 4) except for the adherent layer including IrSiN. Kerlin et al. teach (Column 4 Lines 57 to 67) to use IrSiN to reduce the diffusion of aluminum and platinum (Column 4 Lines 52 to 56). It would have been obvious to a person of ordinary skill in the art at the time of invention to use IrSiN in the device of Nakamura, Fukaya et al. and Yamazaki et al. to reduce the diffusion of aluminum and platinum.

(10) Response to Argument

The Applicants state that the first (lower) electrode of Nakamura's device is not exposed during etching (being covered by either a mask or other layers) and, therefore, the formation of platinum fluoride and the subsequent surface termination of the

Art Unit: 2814

electrode would be prevented. As the Appellants correctly state, Nakamura describes three ways to pattern the electrode/dielectric/electrode structure of the capacitor (Column 4 Lines 42 to 48):

"The patterning can be carried out in several different ways, such as carrying out to the lower electrode 1, the dielectric layer 2 and the upper electrode layer 3 simultaneously, or carrying out only to the lower electrode 1 and then both the dielectric layer 2 and the upper electrode layer 3 simultaneously, or carrying out all the layers independently."

This indicates that Nakamura leaves the choice of methods of patterning up to one of ordinary skill in the art. While the first method listed would cover the upper surface of the lower electrode, forming the lower electrode independently, as the other two methods allow, can be done with exposing the upper surface to the etchant. For example, Hwang et al. (U.S. Patent No. 6,323,132) describe removing a mask during etching a platinum electrode layer. (Column 6 lines 26 to 32) :

"Similarly, the protective layer may be removed during or after the etching step."

and Fukaya et al. teach to remove the photoresist layer (i.e. mask) before subsequent etching (Column 3 Lines 42 to 48):

"That is, after the above MICROPOSIT 1300-27 photoresist was peeled off, dry etching with CF₄ gas was effected by a plasma etching method (also called a reactive ion-etching method)."

Either way would expose the surface of the layers to the etchants and halogen termination.

In reference to Furukawa, the examiner maintains that Furukawa teaches to have the bismuth layer being substantially perpendicular (i.e. vertical) to said first electrode layer as outlined above.

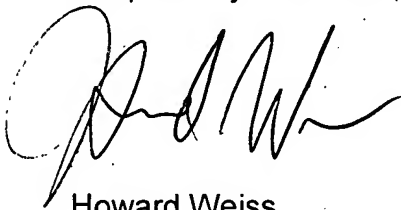
Art Unit: 2814

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Howard Weiss', written in a cursive style.

Howard Weiss

Primary Examiner

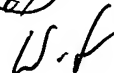
Art Unit 2814

Conferees:

Ricky Mack, SPE Art Unit 2873

A handwritten signature in black ink, appearing to read 'Ricky Mack', written in a cursive style.

Wael Fahmy, SPE Art Unit 2814

A handwritten signature in black ink, appearing to read 'W. F.', written in a cursive style.